

## REMARKS

Claims 1-33 are currently pending in the application, Claims 34-67 having been withdrawn from consideration. Claim 1 is amended herein, which amendments are supported by the Specification at least at page 3, lines 4-7. Claims 1-4, 13, 14, 16-20, and 29-33 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Sundararajan et al. Claims 5-12, 15, 18, and 21-28 stand rejected under 35 U.S.C. § 103(a) as being obvious in light of Sundararajan et al. and multiple other references. Applicants respectfully traverse these rejections.

### 35 U.S.C. § 102(a) Anticipation Rejections

Claims 1-4, 13, 14, 16-20, and 29-33 stand rejected under 35 U.S.C. § 102(a) as being anticipated by the reference of Sundararajan et al., entitled "Supercritical CO<sub>2</sub> Processing for Submicron Imaging of Fluoropolymers." More particularly, the Action indicates that Sundararajan et al. teaches the use of CO<sub>2</sub> as a solvent for lithographic processes.

Under 35 U.S.C. § 102, "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." M.P.E.P. § 2131 (quoting *Verdegaal Bros. v. Union Oil Co.*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987)). Thus, in order to anticipate a claim, Sundararajan et al. must expressly or inherently describe all of the recitations of the claims.

Sundararajan et al. proposes lithographic processes wherein supercritical carbon dioxide may be used to develop or remove polymers from exposed wafers. In particular, the wafer coating process proposed by Sundararajan et al. is a solution spin-coating process wherein "polymer solutions for spin-casting were prepared" and manually dispensed onto a wafer using a pipet. *See, Sundararajan et al.* at p. D, col. 1. "Silicon wafers with the solution were then spun at appropriate speeds to obtain thin films" on the wafers. *Id.* The "polymer solutions for spin-casting were prepared by dissolving 15-20 wt % of polymer in propylene glycol methyl ether acetate (PGMEA)." *Id.* The solutions used in the spin-coating processes of Sundararajan et al. do not include carbon dioxide. Following spin coating, the wafers were baked and "exposures were made using a 193 nm ArF excimer laser source" to cure portions of the polymer coatings. *Id.* at p. D, col. 2. Again, no carbon dioxide is present. Finally, the exposed wafers were then treated with supercritical carbon dioxide to dissolve portions of the polymer on the wafer that remained

soluble to carbon dioxide following the exposure step. Thus, the processes used and described by Sundararajan et al. only use supercritical carbon dioxide during the steps of removing a polymer coating from a wafer that has been exposed to cure a portion of the coating.

Independent Claim 1 of the present application recites a process of forming a resist image, which comprises, in part, “contacting the substrate with a first composition comprising carbon dioxide and a component selected from the group consisting of at least one polymeric precursor, at least one monomer, at least one polymeric material, and mixtures thereof, to deposit the component on the substrate and form a coating thereon” (emphasis added). The processes used by Sundararajan et al. do not include this step. In particular, the processes of Sundararajan et al. do not deposit a coating on a substrate using a first composition comprising carbon dioxide. The lack of such a step in Sundararajan et al. precludes an anticipation rejection under 35 U.S.C. § 102(a). *See, Verdegaal Bros. v. Union Oil Co.*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987).

Sundararajan et al. does comment that “Supercritical fluid CO<sub>2</sub> could thus be envisioned as an ‘environmentally responsible’ solvent for solvent intensive processes in lithography such as the spin-coating and development steps, wherein a polymer soluble in liquid CO<sub>2</sub> could be coated directly using liquid CO<sub>2</sub>, exposed, and then developed using supercritical/liquid CO<sub>2</sub>.” *See, Sundararajan et al.* at p. B, col. 2. However, Sundararajan et al. does no more than “envision” a process wherein a polymer soluble in liquid CO<sub>2</sub> could be coated directly using liquid CO<sub>2</sub>. The processes of Sundararajan et al. do not include such a process and Sundararajan et al. does not describe how such a process may be carried out. Certainly, Sundararajan et al. does not suggest that each step of the process be performed in a closed system. Thus, Sundararajan et al. fails to expressly or inherently describe the step of “contacting the substrate with a first composition comprising carbon dioxide and a component selected from the group consisting of at least one polymeric precursor, at least one monomer, at least one polymeric material, and mixtures thereof, to deposit the component on the substrate and form a coating thereon” as recited in independent Claim 1. The failure of Sundararajan et al. to describe the step as set forth in Claim 1 precludes an anticipation rejection of Claim 1. *See, Verdegaal Bros. v. Union Oil Co.*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987).

Claims 2-4, 13, 14, 16-20, and 29-33 each depend either directly or indirectly from independent Claim 1. As dependent claims, Claims 2-4, 13, 14, 16-20, and 29-33 each include the recitations of Claim 1. The failure of Sundararajan et al. to expressly or inherently describe all of the recitations of Claim 1 also applies to the dependent claims. Therefore, Claims 2-4, 13, 14, 16-20, and 29-33 are not anticipated by Sundararajan et al. and are allowable as dependent claims.

### **35 U.S.C. § 103(a) Obviousness Rejections**

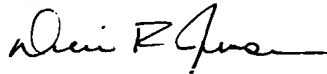
Claims 5-12, 15, 18, and 21-28 stand rejected under 35 U.S.C. § 103(a) as being obvious in light of Sundararajan et al. combined with multiple other references. Each of Claims 5-12, 15, 18, and 21-28 depend from Claim 1. Dependent claims of non-obvious independent claims are also non-obvious. *See, In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988)(stating that if an independent claim is non-obvious under 35 U.S.C. § 103 then any claim depending therefrom is non-obvious); *see also*, M.P.E.P. § 2143.03. Claim 1 is non-obvious. As dependent claims of a non-obvious independent claim, Claims 5-12, 15, 18, and 21-28 are also non-obvious.

In re: DeSimone et al.  
Serial No.: 09/975,211  
Filed: October 10, 2001  
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### CONCLUSION

The concerns of the Examiner addressed in full, Applicants respectfully request withdrawal of the outstanding rejections and the issuance of a Notice of Allowance forthwith. The Examiner is encouraged to direct any questions regarding the foregoing to the undersigned, who may be reached at (919) 854-1400.

Respectfully submitted,

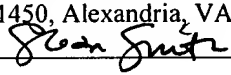


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Sloan Smith